REMARKS

Responsive to the objections and rejections made of the Examiner in office action. We have amended the specification, claims and abstracts. All the errors disclosed in that office action has been corrected according to the Examiner's indications disclosed in the official action. Thereby the claims are amended according to the suggestions in the office action. No new matter is added.

ABOUT CLAIM REJECTION OF 35USC112

Based on the suggestions in the office action, we have amended the claims and specifications based on the following viewpoints.

(1)   The items within the parenthesis in the claims are deleted.

(2)   The improper uses of "locking" are deleted.

(3)   Address flags are the flags of address (this can be found in some digital communication books). In the present invention, the address flag are for all product models indicated by the 26 English characters A.about Z (see lines 19 to 20 of page 5 of specification of the present invention).

(4) a timer 13 adapted to counts the search until an ~~appears~~ interruption_ occurs (line 19 page 6).

(5) In claim 6, the state about the product module function is deleted.

(6)   The function of the present invention will be described herein, which is described from line 2 of page 8 to line 4 of page 9. This section is added to the claim 1 so as make the users know the use of the present invention. The following description is added to the claim 1 and 10.

-8-

The CPU serves to receive power from the power generator 3 and the oscillator 4 and to start a function of automatic quick search action. In the searching process, the main memory 11 and the second memory 17 provide product model code data and address data. Then the signal emitter 21 converts the product code data and address data into emission signals for emitting to the electric appliance through. If the frequency matched, the search interruption control interrupts the searching action and to lock the frequency when the frequency matched. If not, the timer 13 enables the CPU 1 to fetch next data from the main memory 11 and the second memory 17, and then to transmit a next transmission signal for searching. During searching, the time interval control 14 controls the time interval between two searches. When the searched frequency matched, press the search interruption control 15 to lock the frequency. After locking, the CPU 1 fetches the corresponding key matrix input/output 6 from the procedure table memory 12, completing the setting (see the described from line 2 of page 8 to line 4 of page 9).

If there is any error in the specification, or claims, applicant requests and authorizes Examiner to amend the claims, specification and drawings of the present invention so that they can match the requirement of U. S. Patent. Attentions of Examiner to this matter are greatly appreciated.

From above description, it is assured that the suggestions by Examiner in the office action have been carefully considered and the contents of the specifications and claims are amended based on the suggestions. Thus it is now believed that the subject Patent Application has been placed in condition for examination, and such action is respectively requested.

Respectfully submitted.

Jung-Hua Lai

-9-

Dated: 04 / 24 /2006

235 Chung – Ho   Box   8-24

Taipei   Taiwan   R. O. C.

"MARK-UP" COPY OF THE AMENDED SPECIFICATION

Remote controller having auto-search and timer-controlled emitting functions

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a remote controller, and, more particularly, to such a remote controller, which has the functions of auto-search function and timer-controlled emitting function

2. Description of the Related Art

Regular commercially available electric home appliances are commonly equipped with a-remote controllers controller for the operation of control at a-remote places place. When the remote controller of an electric home appliance was lost, it may be inconvenient to purchase a substitute one from the original electric home appliance supplier. Various remote controllers that fit electric home appliances of different models from different suppliers have been disclosed, and have appeared on the market. U.S. Pat. No. NO. 5,910,784 discloses a control circuit of a remote controller, which comprises a CPU, the CPU having a data memory adapted to store signal codes of different electric apparatuses, a procedure table memory adapted to record key switch functions of different electric apparatuses, a computing element for sequencing through a plurality of the stored signal codes, a search interruption adapted to interrupt the sequential output of the signal codes when an output code is in conformity with a selected function of a particular electric apparatus, and an emission output device coupled to the CPU to transmit the signal codes to the electric apparatus. Because there are a number of electric home appliances providing

-11-

a number of electric home appliances of different models, it takes much time in searching of a desired electric appliance to achieve searching when a remote controller which is not provided by the original electric home appliance supplier is used. For example, if there are 1000 product models respectively coded by the codes ranging from 000 to about about 999, and the auto searching frequency and emission time is assumed to be 1.4+0.4=1.8 seconds, thus it requires 2 minutes and 40 seconds to complete the whole searching cycle. Therefore, it is desirable to provide a remote controller which has the functions of auto-search and timer-controlled emitting function.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances in view. According to one aspect of the present invention, the remote controller comprises a CPU, the CPU comprising a main memory (random access memory) adapted to record the search addresses and codes of a plurality of product models, and at least one second memory adapted to record the address flags of all product models indicated by the 26 English characters from A to Z A about Z to establish a product model code table corresponding to the numerical keys from 0 to 12 0 about 12 and keys CH+, CH-, VOL+, VOL-at the remote control. For , for example, the initial character A of AIWA is placed at the address 1 and the initial character H of HITACHI is placed at the address 8; a procedure table memory (read only memory) adapted to record the functions of keys of the product models and to provide the data of the function of every key for locking; a timer adapted to count the search until an interruption appears for locking and to emit power signal from pre-set counting start time to pre-set counting end time; a time interval control adapted to control time interval for locking during searching; a search interruption control adapted to interrupt the searching

-12-

action and to lock the frequency when the frequency matched, and a signal emitter adapted to transmit a frequency modulated search signal.

According to another aspect of the present invention, the remote controller further comprises a LCD coupled to the CPU for displaying the setting date and time and the process of auto searching, so that the user can know the current operation mode and the code, and the current time and product code when locking.

According to still another aspect of the present invention, the remote controller can be set to automatically emit power signal to turn on/off the electric home appliance at the set time. Therefore, when nobody is at home, the remote controller automatically emits power signal to turn on/off the electric home appliance at the set time, assuming the presence of a person at home.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of a control circuit used in a remote controller according to the present invention.

FIG. 2 is a key matrix function conversion table according to the present invention.

FIG. 3 is a circuit block diagram of the present invention.

FIG. 4 is an operation flow chart of the remote controller according to the present invention.

FIG. 5 is a block diagram of an alternate form of the present invention.

FIG. 5-1 is a block diagram of another alternate form of the present invention.

FIG. 5-2 is a block diagram of still another alternate form of the present invention.

FIG. 6 is a LCD setting flow chart according to the present invention.

FIG. 7A is a schematic drawing showing an example of one single key auto search operation according to the present invention.

FIG. 7B is a schematic drawing showing an example of one single key direct setting operation according to the present invention.

FIG. 8 is a circuit diagram showing the procedure of timer-controlled auto transmission flow according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 to 3 ~~1 about 3~~, the control circuit of a remote controller in accordance with the present invention is shown. It is illustrated that the control circuit comprises ~~comprising~~ a CPU 1. The CPU 1 comprises a main memory 11 adapted to record the search addresses and codes of all commercially available product models, at least one second memory 17 adapted to record the address flags of all product models indicated by ~~the~~ 26 English characters from A to Z ~~A about Z~~. Alternatively, one second memory 17 can be divided into at least two memory zones 172 for recording the address flags of all product models indicated by the 26 English characters from A to Z ~~A about Z~~ to establish a product model code table corresponding to the numerical keys from 0 to 12 ~~0 about 12~~ and keys CH+, CH-, VOL+, VOL-at the remote controller ~~control~~. For example, the initial character A of AIWA is placed at the address 1; the initial character H of HITACHI is placed at the address 8 (see the function matrix table in FIG. 2). Because product category and address code are properly arranged, the user needs only to press the corresponding product category key and then the corresponding product model address numerical key to complete the setting (see the direct setting flow chart shown in FIG. 5). The CPU 1 further comprises a procedure table memory 12 adapted to record the functions of the keys of all product models recorded in the second memory and to provide the data of the function of every key ~~for locking~~, an

-14-

EEPROM (electrically erasable programmable read only memory) 16 adapted to record the functions of the keys of the originally set codes of every product model for keeping the set code functions of every product model in function after an interruption of power supply due to a temporary power low or power failure, a timer 13 adapted to measure the search time period count the search until an appears interruption occurs for locking, a time interval control 14 adapted to control time interval at, for example, 1.5 seconds for locking, and a search interruption control 15 adapted to interrupt the searching action and to lock the frequency when the frequency matched. On the same circuit board outside the CPU 1, an external second memory 171 is provided and electrically coupled to the CPU 1 for recording the address flags of different product models indicated by the 26 English characters. The external second memory 171 may be divided into a plurality of memory zones 1711 for recording the address flags of different product models indicated by the 26 English characters. The main memory 11 of the CPU 1 may be divided into a plurality of memory zones 111 for recording the address flags of different product models indicated by the 26 English characters, or the procedure table memory (ROM) 12 may be divided into a plurality of memory zones 121 for recording the address flags of different product models indicated by the 26 English characters (see FIGS. 5-1 and 5-2).

The control circuit may be mounted with an indicator light driver 162 and an indicator light output circuit 2 and a signal emitter 21 for controlling on/off of the indicator light at the control panel and emitting frequency modulated search signal, and a power generator 3 to provide the CPU 1 with the necessary working voltage, and an oscillator 4 to provide the CPU 1 with the function of counting time.

Referring to FIG. 3 again, when using the remote controller, the remote controller is aimed at the electric appliance (a TV, a video cassette

tape recorder/player, a CD player, stereo system, an air conditioner, or a satellite TV-tuner, etc.). The first operation method (as shown in FIGS. 7A and 7B) is to press "product category key", it will drive driving the CPU 1 to receive power supply from the power generator 3 and the oscillator 4 and to start automatic quick search action. During searching, product model code data and address data are respectively fetched from the main memory 11 and the second memory (flag supplementary data memory) 17 and then converted into emission signals an emission signal for being emitted emitting to the electric appliance through the signal emitter 21. Upon power On or Off reaction of the electric appliance, it means the frequency matched, and the search is interrupted. If not, the adding function of the timer 13 enables the CPU 1 to fetch next data from the main memory 11 and the second memory 17, and then to transmit a next transmission signal to the electric appliance for searching. During searching, the time interval control 14 controls the time interval between searches to be at, for example, 1.5 seconds. When the searched frequency matched, press the search interruption control 15 is pressed to lock the frequency. After locking, the CPU 1 fetches the corresponding key matrix input/output 6 from the procedure table memory 12, and completing the setting operation is completed. (see the reference function table of the key matrix shown in FIG. 2.

Referring to FIG. 3, the control circuit of the remote controller may be mounted with an a LCD 5. The second operation method is to press "product category key", and then to aim the remote controller at the electric appliance (a TV, a video cassette tape recorder/player, a CD player, a stereo system, an air conditioner, or a satellite TV-tuner, etc.), and then to press "auto search key", thereby entering auto quick search operation. During operation, the user can know the current mode. During auto search scanning, the LCD 5 displays the current product category (for example, TV and its numerical

code; product category numerical codes arc respectively indicated by 000, 001, . . . 010, and so on). When a power on/off reaction produced, it means that the frequency is matched, and the frequency is locked ~~looking is done~~ when pressing any key of the remote controller. At the same time, the produce category numerical code is shown on the LCD 5. When a calculator sign appeared on the LCD 5 during product category selection, the keys of the remote controller are defined to run the function of a calculator (scc FIG. 6).

The operation principle of the present invention is outlined hereinafter.

At first, in addition to the main memory 11 at the CPU 1, at least one second memory 17 is provided to record product codes by the 26 English characters from from A to Z ~~A.about.Z~~, and the numerical keys 0 to 12 ~~0 . . . 9.about.11.about.12~~ and CH+, CH-, VOL+, VOL keys are used to match the required operation. The characters of A, B, C . . . Y, Z are put into numerical keys (scc key function matrix table in FIG. 2) (the electric appliance suppliers having the initial character A are put in the address 1; for example, HITACHI having the initial character H is put in the address 8). According to this classification, ~~about 1.about.24~~ addresses from 1 to 24 are enough. The operation is quite simple (scc FIGS. 7A and 7B). ~~Keep~~ when the category key (for example, TV or VCR) is pressed, and then ~~press~~ the numerical key 8 is pressed, representing the initial H, and then ~~release~~ the keys are released at the same time to finish the setting. Thus, the remote controller is defined to substitute for the remote controller of the original product model. According to this method, there are twenty and more addresses for direct setting (scc FIG. 5). If the direct setting is not operative, please use automatic quick search method as shown in FIGS. 5-1 and 7A, i.c., keeps TV key pressed for 1.5 seconds in which the indicator light is on and another 1.5 seconds in which the indicator light is off, and then release

-17-

the key to enter auto searching state. The whole scanning cycle is done within a short period of time. It is faster than the operations of searching the code and then inputting the code that is composed of three numerals.

The product single code direct setting method of the invention is as follows:

At first, find the product address is found from the key function matrix table (see FIG. 2), (for example, the initial character A of AIWA is placed at the address 1 and the initial character H of HITACHI is placed at the address 8). By means of this classification method, twenty and more addresses are sufficient (arranged subject to the order of internal districts and product makers' scale). The operation procedure is quite simple. At first it is needed to keep keeps the corresponding key of the key matrix input/output 6 (for example TV) pressed and then press the numerical address key 8, and then release the keys to complete the setting. (see FIGS, 5-2 and 7B).

With respect to timer-controlled auto emission, it is explained as follows:

After installation of battery in the remote controller (the default value of time of the remote controller is 12:00), the user presses press the category selection key and then releases release the hand from the category selection key when flashing of 12:00 appeared on the display screen of the LCD (5), and then presses press the power key of the key matrix input/output 6 and the numerical keys from 0 to 9. Thus the setting operation is completed 0.about.9 to finish the setting.

If you wish to turn on the electric appliance at 3:00 PM, it is necessary to press the category selection key and then release the hand from the category selection key when flashing of 12:00 appeared on the display screen of the LCD (5), and then press the power key of the key matrix input/output 6 and the numerical keys from 0.about.9 to show 15:00 on the

-18-

LCD (5) without flashing, and then press the press the power key to complete the setting. If the remote controller A1 set to control the TV, the remote controller must be aimed at the TV within an the angle of +- 35 degrees -+-35-degree- and a the distance of 7.5 meters. When the set time comes, the remote controller automatically emits a power frequency signal to turn on the TV.

A prototype of remote controller has been constructed with the features of FIGS. 1 to 8 1 about 8. The remote controller functions smoothly to provide all of the features discussed earlier.

Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. For example, the fans used can be cooling fans for use in hot weather, or fans with electric heater means for use in cold weather Accordingly, the invention is not to be limited except as by the appended claims.

-19-

Remote controller having auto-search and timer-controlled emitting

functions

Abstract

A remote controller includes a CPU having a main memory for recording the search addresses and codes of multiple product models and a second memory for recording the address flags of the product models indicated by ~~the~~ 26 English characters, a procedure table memory for recording the functions of keys of the product models and to provide the data of the function of every key ~~for locking~~, a timer for <u>measuring the searching time period</u> ~~counting the search~~ until an interruption appears ~~for locking~~ and emitting power signal, a time interval control for controlling time interval ~~for locking~~ during searching, a search interruption control ~~for locking~~ control, and a signal emitter for emitting a frequency modulated search signal.